WHAT IS CLAIMED IS:

1   1.   An inverter driver comprising:

2   an inverter circuit including a first switch and a second switch, for inverting DC

3   components into AC components in response to a switching operation by the first and

4   second switches to drive a load;

5   a control signal supply that outputs a first voltage corresponding to a voltage

6   caused by sensing the current flowing to the load, and that outputs a second voltage,

7   wherein a third voltage is generated by multiplying the first voltage by a predetermined

8   gain;

9   a frequency controller including a capacitor and an oscillator having a first end

10   coupled to the capacitor, that controls a first current charged in/discharged from the

11   capacitor through the first end of the oscillator in response to the first voltage to control

12   the frequency of the oscillator; and

13   a duty controller that compares the third voltage and a fourth voltage charged in

14   the capacitor, and controls the duty of the first and second switches in response to

15   comparison results.

1   2.   The inverter driver of claim 1, wherein the frequency controller comprises:

2   a subtractor that subtracts a first reference voltage from the first voltage and

3   outputs a fifth voltage;

4   a first resistor having one end coupled to a second end of the oscillator, and

5   another end coupled to the fifth voltage; and

6   a second resistor coupled between the second end of the oscillator and a sixth

7   voltage,

8   wherein the current flowing to the first end of the oscillator is the same as the

9   current flowing to the second end of the oscillator.

1   3.   The inverter driver of claim 2, wherein in the frequency controller, a

2   second current flowing to the first resistor varies according to the fifth voltage, a third

3   current flowing to the second resistor is constant, and the first current charged

4   in/discharged from the capacitor corresponds to the difference between the second and

13

5 third currents.

1   4.   The inverter driver of claim 2, wherein the subtractor is a diode coupled to
2 the first voltage and one end of the first resistor.

1   5.   The inverter driver of claim 4, wherein the diode is a Zener diode having
2 the first reference voltage as a breakdown voltage.

1   6.   The inverter driver of claim 2, wherein the sixth voltage is a ground
2 voltage.

1   7.   The inverter driver of claim 1, wherein the frequency controller comprises:
2   a first resistor coupled between the first and fifth voltages;
3   a first current mirror having a first end coupled to one end of the first resistor, for
4 outputting a current identical with a second current flowing to the first resistor to a second
5 end;
6   a second resistor coupled between the second end of the first current mirror and
7 the sixth voltage; and
8   a second current mirror having a first end coupled to one end of the second
9 resistor, and a second end coupled to the second end of the oscillator, for supplying the
10 current identical with the first current flowing to the first end to the second end of the
11 oscillator through the second end,
12   wherein the currents flowing to the first and second ends of the oscillator are the
13 same.

1   8.   The inverter driver of claim 7, wherein a second current flowing to the first
2 resistor varies according to the fifth voltage, a third current flowing to the second resistor
3 is constant, and the first current flowing to the first end of the second current mirror
4 corresponds to the difference between the second and third currents.

1   9.   The inverter driver of claim 8, comprising an OP amp having a first input
2 end coupled to the first voltage, a second input end coupled to one end of the first resistor,

3   and an output end coupled to a third end of the first current mirror.

1   10.   The inverter driver of claim 8, wherein the fifth and sixth voltages are the
2   ground voltage.

1   11.   The inverter driver of claim 1, wherein the control signal supply
2   comprises:
3   a comparator for comparing a voltage generated by sensing the current flowing to
4   the load with the first reference voltage, and outputting the first voltage;
5   first and second resistors coupled in series between the input voltage and ground;
6   a subtractor for subtracting a voltage at a node between the first and second
7   resistors from a second reference voltage, and outputting the second voltage; and
8   a multiplier for multiplying the first voltage output from the comparator and the
9   second voltage output from the subtractor by a predetermined gain, and outputting the
10   third voltage.

1   12.   The inverter driver of claim 1, wherein the duty controller comprises:
2   a comparator for comparing the third voltage output from the control signal supply
3   with the fourth voltage charged in the capacitor of the frequency controller;
4   a latch circuit for respectively receiving signals from the comparator and clock
5   signals from the oscillator of the frequency controller through first and second input ends,
6   and outputting On/Off signals according to input signals;
7   a logic operator for respectively receiving output signals from the latch circuit and
8   clock signals from the oscillator through first and second input ends, executing a logic
9   operation based on the received signals, and outputting logic operation results to first and
10   second output ends;
11   a first gate driver for controlling a switching operation of the first switch of the
12   inverter circuit on the basis of signals output from the first output end of the logic
13   operator; and
14   a second gate driver for controlling a switching operation of the second switch of
15   the inverter circuit on the basis of signals output from the second output end of the logic
16   operator.

1   13.   The inverter driver of claim 1, wherein the load is a lamp of an LCD

2   (liquid crystal display) light.

1   14.   A driving method of an inverter driver comprising an inverter circuit

2   including a first switch and a second switch, for inverting DC components into AC

3   components in response to a switching operation by the first and second switches to drive

4   a load; a control signal supply for outputting a first voltage corresponding to a voltage

5   caused by sensing the current flowing to the load, and outputting a second voltage as well

6   as a third voltage generated by multiplying the first voltage by a predetermined gain; and

7   a frequency controller including a capacitor and an oscillator having a first end coupled to

8   the capacitor, the method comprising:

9   (a) controlling a first current charged in/discharged from the capacitor through the

10 first end of the oscillator in response to the first voltage to control the frequency of the

11 oscillator; and

12   (b) comparing the third voltage with a fourth voltage charged in the capacitor, and

13 controlling the duty of the first and second switches in response to comparison results.

1   15.   The driving method of claim 14, wherein the frequency controller

2   comprises:

3   a first resistor having one end coupled to a second end of the oscillator, and

4   another end coupled to the first voltage; and

5   a second resistor coupled between the second end of the oscillator and a sixth

6   voltage, and

7   (a) comprises changing a second current flowing to the first resistor according to

8   the first voltage, maintaining a third current flowing to the second resistor, and charging

9   in/discharging from the first current corresponding to the difference between the second

10 and third currents to control the frequency of the voltage at the capacitor.

1   16.   The driving method of claim 15, wherein the frequency of the voltage at

2   the capacitor is the maximum when the first current is the maximum.

1   17.   The driving method of claim 16, wherein the second current value is 0

2   when the frequency is the maximum.

1   18.   The driving method of claim 17, wherein the frequency controller further

2   comprises a subtractor for subtracting a first reference voltage from the first voltage,

3   outputting a fifth voltage, and supplying the fifth voltage to one end of the first resistor.

1   19.   The driving method of claim 18, wherein the subtractor is a Zener diode

2   having the reference voltage as a breakdown voltage.

1   20.   The driving method of claim 14, wherein (a) comprises setting the

2   minimum frequency at the capacitor to be greater than a resonance frequency of the

3   inverter circuit.

1   21.   The driving method of claim 14, wherein the duty control in (b) is

2   performed when the frequency of the voltage at the capacitor reaches the maximum

3   frequency.